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Fresh Insights
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HeadsUp

REUTERS / JARNO MELA / LEHTIKUVA

Linus Torvalds says the fact that Apple is giving away the latest version of OS X is "completely irrelevant" and will have no impact on Linux. The Linux creator is shown here speaking in Helsinki in June after being awarded the 2012 Millennium Technology Prize.

OPERATING SYSTEMS

Apple's Free OS Is 'Irrelevant,' says Torvalds

LINUS TORVALDS isn't concerned about Apple's decision to make its latest desktop operating system available free of charge. Dismissing the move as "irrelevant," he said it won't affect Linux, the open-source operating system he created.

In late October, Apple announced that its newest operating system — OS X 10.9, or Mavericks — will be a free upgrade for most Mac owners, including those with machines up to six years old. With past releases, Apple charged upgrade fees ranging from $20 to $139.

No-cost upgrades are standard procedure for Linux, which has been free for 22 years, Torvalds said at the LinuxCon Europe conference in Edinburgh. And apart from the price, Apple's gambit has little in common with the Linux model, he noted.

While Mavericks may be free, it isn't open source, and people still need expensive hardware to use it, he said. "The fact that Apple gives the OS away is completely irrelevant," Torvalds said. "I don't think that it impacts Linux at all."

In other comments, Torvalds said he doesn't do a lot of programming these days, but he still likes what he does. He said he likes to be responsive to those developers and maintainers of the kernel who reach out to him, even though some developers have "the attention span of slightly moronic woodland creatures."

Torvalds said he has no idea what Linux will look like in five years. "I never had a plan. I still don't have a plan," he said. "It is just that what works survives."

– Loek Essers of the IDG News Service and Gregg Keizer

SOCIAL MEDIA

Open-Source Tools Keep Twitter Running

To curb disruptions and scale up its service while keeping costs down, Twitter has drastically changed its core infrastructure and has adopted some open-source tools.

Twitter processes about 6,000 messages per second — that's more than 500 million a day and about 3.5 billion a week. The company set a record earlier this year, with 143,000 messages per second during the airing of a movie in Japan, said Chris Aniszczyk, Twitter's head of open-source computing, at a recent conference in Europe.

When Twitter debuted in 2006, it used a monolithic Ruby on Rails application. That worked fine until 2008, when the microblogging service started to suffer a lot of "fail whales" — the company's term for service disruptions.

The company decided to break the one application it had been using for everything into different services, Aniszczyk said. It also started using open-source tools such as Apache Mesos, a cluster manager; Netty, for creating high-performing protocol servers; and Scalding, for writing big data jobs.

And in another move, Twitter switched its core infrastructure to a Java virtual machine. The end result, said Aniszczyk, is a performance improvement and fewer disruptions.

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BETWEEN THE LINES
By John Klossner

CLOUD COMPUTING

Google Culture Draws Whirlpool to Apps

IN ANOTHER EXAMPLE of how the lines between business and personal computing are blurring, Whirlpool has decided to use Google Apps because it's convinced that Google's focus on consumers gives it an innovation edge in enterprise software.

The way Whirlpool sees it, battling in the ferociously competitive and fast-changing consumer Internet market forces Google to innovate at breakneck speed and to stretch its technology vision into the future.

"You get the relentless consumer-based innovation pressure on the products that can then be promoted into the enterprise suite," Whirlpool CIO Mike Heim told the IDG News Service after Google announced the deal.

Over the coming year, Whirlpool will move about 30,000 employees globally from an on-premises IBM Lotus Notes email and collaboration system to the cloud-based Google Apps suite, which includes Gmail, Calendar, Sites, Docs and Drive.

Ironically, Google rivals and critics often say that Google's consumer focus is a reason not to use Apps in the enterprise. They point out that Google generates most of its revenue from online advertising delivered through its consumer online services, and argue that IT leaders should question whether they want their email and collaboration systems to depend on a company whose main business isn't enterprise software.

But for Heim, it's the dual commitment to both the consumer and enterprise markets that makes Google such an attractive vendor. "We get the chance to leverage that relentless innovation in their product into our core capabilities," he said. "We like that model."

Heim acknowledged that Whirlpool wasn't using IBM's latest and greatest wares, and that the decision to switch to Apps was also driven by people's familiarity with Google's online services in their personal lives.

"We bought into the Google notion to work the way you live," he said.

– *Juan Carlos Perez, IDG News Service*

Micro Burst

U.S. shipments of tablet computers are projected to grow by

53%

this year as the PC market keeps shrinking.

IT BUDGETS

Tech Spending Slows, Thanks To Congress

Tech spending in the U.S. will increase by a smaller amount this year than earlier predicted, mostly because of moves in Congress, says Forrester Research.

The research firm now projects that tech spending will increase by 3.9% this year; that's well below its earlier prediction of 5.7%.

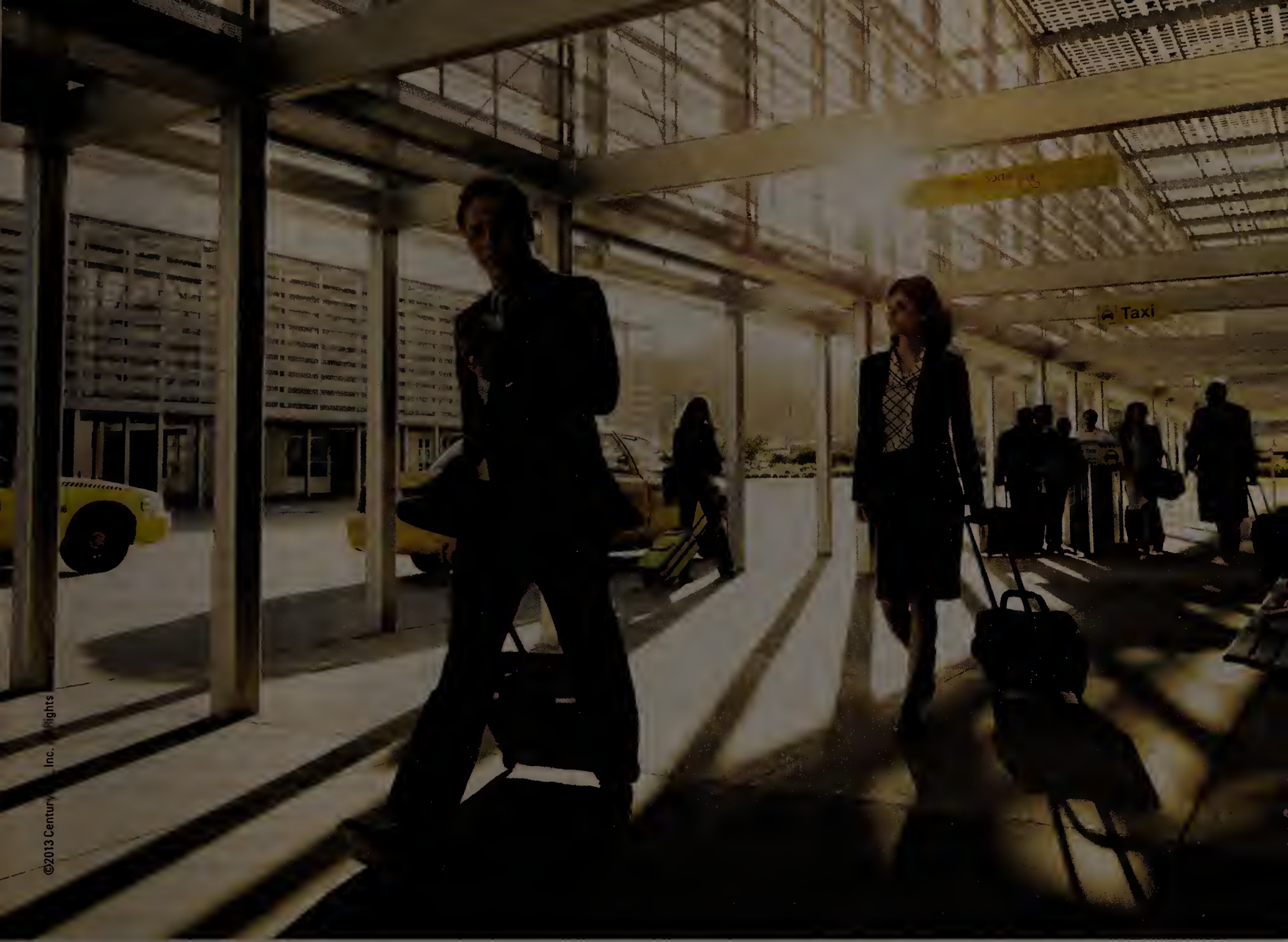
The federal budget sequester, the government shutdown and the threat of default have had "negative impacts on the economy" and "direct negative impacts on federal tech buying," as well as indirect impacts on "CIOs who simply became cautious," said Andrew Bartels, a Forrester analyst.

For instance, Bartels said that CIOs who might have bought servers to meet new demand for computing power are instead moving peak loads and special projects to infrastructure-as-a-service providers.

The White House estimates that the 16-day government shutdown reduced the growth rate of GDP in this quarter by 0.2% to 0.6%.

Next year, Forrester projects that U.S. business and government purchases of IT goods and services will rise by 5.3%, thanks to a revived housing market, "modest improvement" in employment and consumer spending, and improved exports.

– PATRICK THIBODEAU



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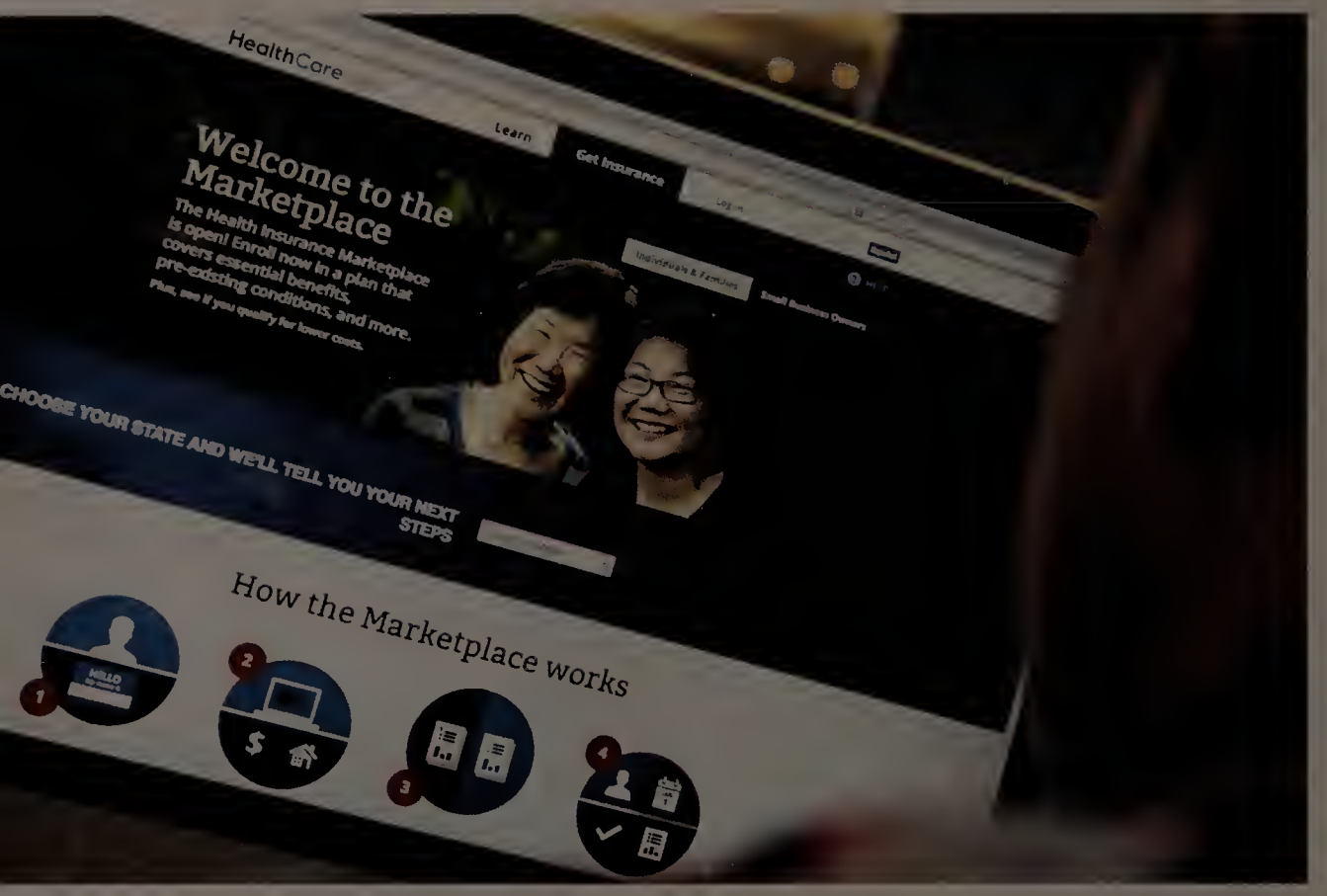

Healthcare.gov Had 'No Chance in Hell'

Major commercial and government development projects routinely go over budget and fail to meet user expectations early on – and that was the case with the ACA website. By Patrick Thibodeau

MOST LARGE enterprise IT projects miss deadlines, go over budget and fail to make users happy, according to Standish Group research.

That was certainly true of Healthcare.gov, which stumbled badly after its Oct. 1 launch.

President Barack Obama says there's "no excuse" for the problems that have afflicted the website that people are supposed to use to shop for health insurance under the Affordable Care Act (ACA). Jeffrey Zients, a former management consultant appointed by the administration to fix Healthcare.gov, is promising to have all the remedial work done by the end of this month. But "it'll take a lot of work," he said. "There are a lot of problems that need to be addressed."

The troubled rollout shouldn't come as a surprise — the early success rate for large, complex IT systems is very low.

And this particular initiative was extremely complex, experts say.

Healthcare.gov isn't just a website — it has multiple interactions and interdependencies with data stored at other agencies and private-sector companies, said Lev Lesokhin, senior vice president at Cast, a software analysis and measurement firm. It's likely the site has 500,000 lines of code, he added.

At the request of *Computerworld*, Standish Group analyzed the outcomes of multimillion-dollar initiatives in its database of some 50,000 government and commercial projects.

Of 3,555 projects from 2003 to 2012 that had labor costs of at least $10 million, only 6.4% were successful. The Standish data showed that 52% of the large projects were "challenged," meaning they were over budget, behind schedule or didn't meet user expectations. The remaining 41.4% were failures, meaning they had to be abandoned or were started anew from scratch.

The Healthcare.gov developers "didn't have a chance in hell," said Jim Johnson, founder and chairman of Standish. "There was no way they were going to get this right — they only had a 6% chance."

Johnson said the ACA project is fixable, and the rollout problems aren't "life-threatening at this point."

The Healthcare.gov mess follows well-publicized demises of other major government IT projects. Late last year, for instance, the U.S. Air Force said it was halting an ERP project that had already cost $1 billion. Similar scenarios played out when the FBI abandoned a $170 million virtual case initiative, a U.S. Census Bureau automation project suffered big cost overruns, and an Orange County, Calif., tax system modernization project was found to be "fatally flawed."

Johnson said Healthcare.gov may have been doomed by an attempt to pull off the "most dangerous" of software project feats: a "big bang" release, in which an entire site goes live at once.

Other factors could have included an excess of changes during development, too much bureaucracy, or slow-moving government and contractor designers and developers, he added.

> "There was **no way** they were going to get this right – they only had a 6% chance."

Contractors involved in the project blamed inadequate testing of the site's many integrated components. Indeed, the 55 contractors had but two weeks to conduct end-to-end testing of Healthcare.gov prior to launch.

The administration initially awarded contracts worth about $93 million for the project, but costs have since soared well beyond that. ◆

Grant Gross *of the IDG News Service contributed to this story.*

REUTERS / MIKE SEGAR

Craig Federighi, Apple's senior vice president of software engineering, announces the company's decision to give away OS X upgrades on Oct. 22 in San Francisco.

Apple Puts Ball in Microsoft's Court

Apple's new free software and upgrade strategy is seen by analysts as an offensive and a defensive move to challenge Microsoft. By Gregg Keizer

APPLE'S decision to give away OS X upgrades and other software, including the iWork productivity suite, is seen as both an offensive and a defensive move that challenges Microsoft to respond.

Apple is banking on a continuation of the bring-your-own-device (BYOD) movement, where workers choose their own hardware rather than letting IT decide what they can use. As part of its strategy, the company is putting a free iWork suite on all of its new devices, and it hopes that move will generate interest in the software among people who use iPad tablets at work — and that they will then try to persuade their IT departments that Microsoft's Office suite isn't needed on every machine.

Gartner analyst Carolina Milanesi called Apple's decision to offer iWork free on new iPads and iPhones a defensive one that aims "to get users to be more engaged with their [Apple] devices."

"Apple's concerned about the enterprise and Windows 8, where software selection is still largely in the hands of IT managers," Milanesi said. "Apple wants to keep its sweet spot in the enterprise, and counter moves by Microsoft to try and slow the iPad influx there."

Those moves by Microsoft include an aggressive pitch that its Surface tablets are more productive for business users than Apple's iPad, and the bundling of a scaled-back version of Office with the $499 Windows RT-based Surface 2.

Meanwhile, Office on every device is Microsoft's past-present-and-future strategy, best evidenced by Office 365, a subscription service that lets businesses and consumers put the suite on up to five mobile devices and five PCs or Macs assigned to an employee.

Apple will count anything it can do to disrupt that business model as a win, said Patrick Moorhead, an analyst at Moor Insights & Strategy.

"It's an opportune time to catch Microsoft off base. Apple would like to disrupt [Microsoft] before it gets to a more service-oriented model," said Moorhead, who describes Apple's free software push as an offense-minded, long-term strategy.

Apple is leveraging the trend in mobile, "where the expectation is that software is basically free," said Moorhead. "Microsoft currently charges for major [OS] upgrades, but over the long term, that's going to make Microsoft's business model look odd and strange and expensive."

Perception is everything, Moorhead stressed.

If businesses and consumers are constantly reminded that Apple offers free software, free services and free upgrades, eventually that will sink in and make them wonder why Microsoft asks for payment — even if, as both Moorhead and Milanesi noted, iWork is no Microsoft Office.

But Ross Rubin, an analyst at Reticle Research, says Apple's free software strategy doesn't pose much of a short- or long-term threat to Microsoft. "There's discrete value in [Microsoft's] larger releases" such as the one from Windows 7 to Windows 8.1, which currently costs about $115 on Amazon.com, he said. "Microsoft will continue to make the case that, 'We charge for Windows because there's premium value associated with it.'"

That's not to say Microsoft won't give away software: It did just that with Windows 8.1, a free update.

In fact, Rubin believes that Apple's moves were at least partly a reaction to a free Windows 8.1. ◆

> It's an opportune time to **catch Microsoft off base.** Apple would like to disrupt [Microsoft] before it gets to a more service-oriented model.
>
> ANALYST, MOOR INSIGHTS & STRATEGY

THE Grill

Becky Blalock

This IT leader has advice for women looking to advance: Believe in yourself.

What are you reading these days? *Flash Foresight*, by Daniel Burrus.

What's on your iPod? This Week in Tech, Real Secrets of the Top 20%, Freakonomics Radio and '70s music.

Stretch goal: Run a marathon.

What's your proudest achievement? Raising a smart, beautiful and successful daughter.

What's the best leadership advice you've ever received? Know what's important and focus on it.

Dream dinner party guests: Oprah Winfrey, Abraham Lincoln and Thomas Edison.

What would people be surprised to learn about you? I'm an avid gardener.

IN HER 33-YEAR CAREER *with $18 billion Southern Co., IT veteran and first-time author Becky Blalock held positions in accounting, finance, corporate communications, external affairs and IT, where she rose to the rank of senior vice president and CIO before retiring in 2011. Regardless of the department, she continually encountered young women starved for career tips who sought mentors to share lessons learned and real-life how-to information. That experience, combined with the fact that she always wanted to write a book and "couldn't just go from being CIO to doing nothing," led her to pen* Dare: Straight Talk on Confidence, Courage and Career for Women in Charge, *which was published last month.*

You worked in many areas and had a lot of experience outside of IT. Obviously that was instrumental in your making it to the C-suite. What else helped? One of the things that really gave me comfort is the fact that I went to four high schools, three junior high schools and eight elementary schools. All my life I was thrown into new situa-

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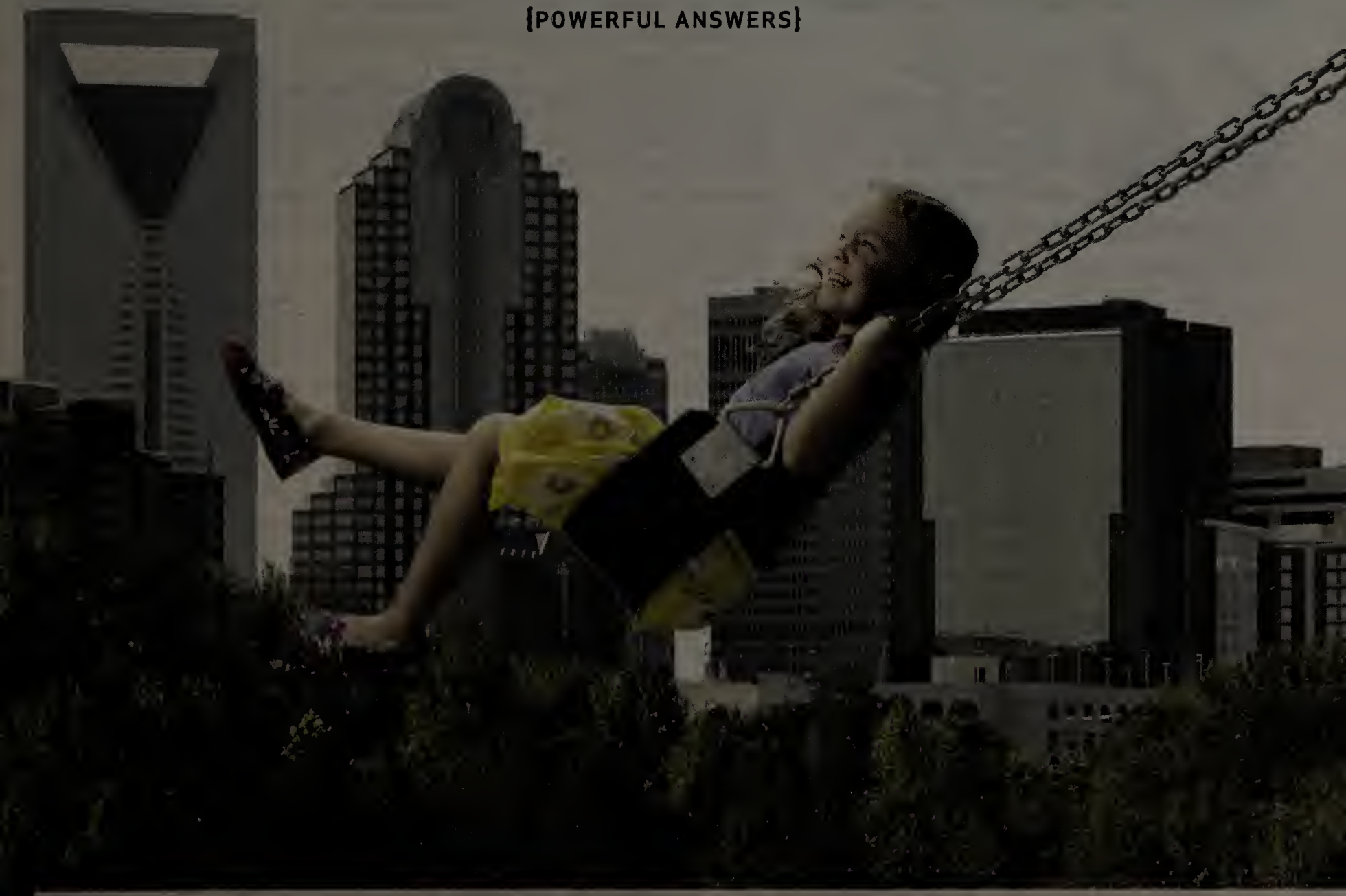
WHEN MACHINES COMMUNICATE, *THE CITY OF CHARLOTTE BENEFITS.*

{POWERFUL ANSWERS}



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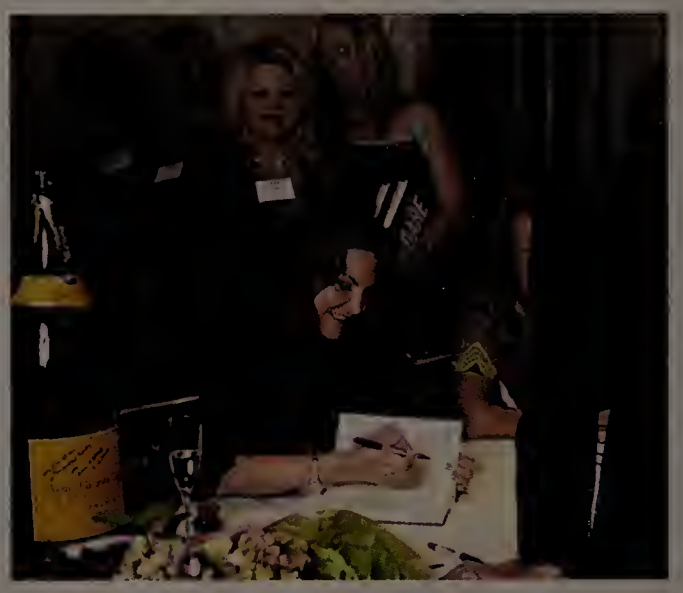


> **The single greatest thing that holds women back is confidence.** Women need to believe in themselves so much more than they do.

tions. I had to learn to adapt. While I hated all of that growing up, I look at it as something that was a gift.

Federal Reserve CIO Lyn McDermid, whom I interviewed for the book, was a military brat, too, and she says that experience of going into new situations helped her, too.

But the single greatest thing that holds women back is confidence. Women need to believe in themselves so much more than they do.

We all live in these comfort zones where we feel safe and valued and appreciated, but you have to push yourself out of those things. That's what qualifies you for the next job level.

How do women get on the radar screen, especially at companies where the "old boys' network" is alive and well? There is definitely an old boys' network. When you look at businesses at the very top, it's white males that dominate. I don't think men purposely exclude women. I think they don't think about the advantages they have [as men]. Women have to educate them.

I went to an executive conference and 20% of the men in the room came up and asked how they could be more sensitive to women. I told them to be sensitive to the fact that you need to give women equal face time. If you're taking a man out to play golf, give a woman an opportunity to have exposure to you — perhaps have her work on a special project.

Women don't have equal access to decision-makers. Men clearly have an advantage and some of them get really angry when you bring it up. But I won't make men mad who have daughters and who care about their daughters' progress.

You write about the need to understand the difference between managing and leading. Tell me about that difference. There is a big difference. A lot of people in middle management can't understand why they don't make it to the next level. In middle management, you're executing on ideas that someone else has created.

It's not easy to execute, but the higher value to a corporation is not just doing what someone tells you, but figuring out what needs to be done. What are we doing? Do we need to make a change? Do we need to shift the customer base? That's higher thinking than when you're in mid-management. In a leadership position, you need to be thinking ahead and looking around the corner. You may only have 20% of the information you need, but you have to be smart and courageous enough to go to the next level, even with that limited information.

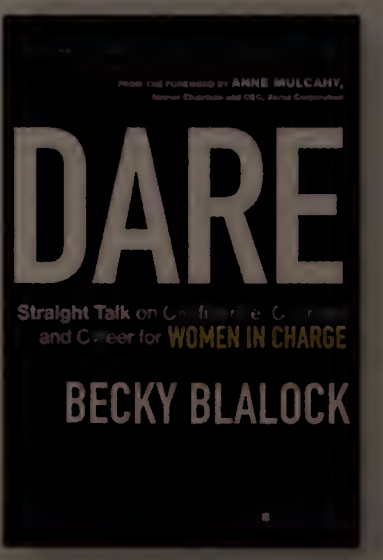
How should middle managers position themselves to take advantage of those career-defining moments? I think a career-defining moment is anytime you are put in charge of a high-profile project or have a chance to get in front of a group of executives and show them who you are. People in senior management are always looking for talent.

I was always on the lookout for stars. I used to spend a lot of time on that. That's part of the reason that *Computerworld* was always picking Southern Co. as one of the Best Places to Work in IT: We put so much focus on leadership development.

As an employee, if you have an opportunity to get in front of a decision-maker, you have to leverage that for all it's worth. Don't shy away. I know a very smart and talented woman who was frightened to do that. I think public speaking and confidence and leadership are learned skills. People aren't born knowing how to do those things. But you have to put yourself out there. You have to be able to stick your head out there and get it chopped off. It's not failing. It's what you learn from it.

Do all of these tips apply to men as well as women? The truth is you have to be very careful about putting anybody in a box. Men suffer from a deficit of confidence just as much as women, but women are much more obsessed with being liked. In general, when I talk with my female friends, we're much more sensitive about things and take things much more personally.

When I interviewed men, I asked them what one thing they'd change about women. Some of them would say women take things much too personally and that they need to lighten up in the workplace. Women pick up on clues that men never see. Overall, women score 3% higher on IQ tests, but they think different. That's why it's important to have different people on a team.



– *Interview by* **Julia King**

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BART PERKINS

Global Standards, Meet Local Constraints

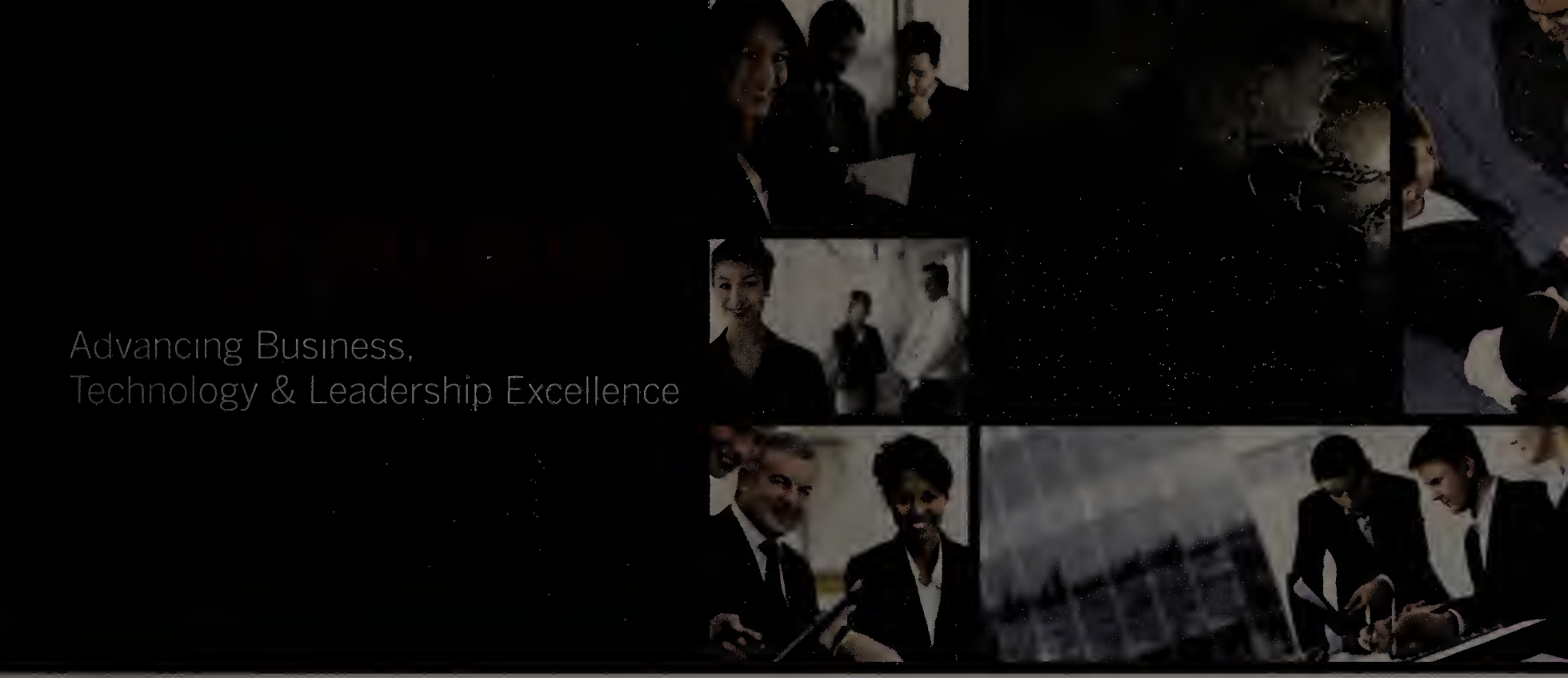
> The benefits of standardization will always run up against the arcane needs of far-flung field locations.

GLOBAL IT systems sound so appealing, at least to headquarters staff. But don't fool yourself; the benefits of standardization will always run up against the arcane needs of far-flung field locations. Most obviously, there's the need to support multiple languages, alphabets and currencies, not to mention local data in formats that differ from headquarters' systems. But that's just scratching the surface of the constraints you can encounter. Consider these, for example:

- **Taxes.** Some countries impose punitive import duties or sales taxes on hardware and software, making systems shipped from the home office much more expensive than local options.
- **Accounting rules.** Local regulations vary widely. For example, French financial records must be maintained in French and use an account numbering structure defined by France's Comité de la Réglementation Comptable. The generally accepted accounting principles (GAAP) of the U.S. are different from India's; profits calculated under U.S. GAAP are typically lower than those calculated using India's GAAP. Complicating this, India's GAAP is being updated to be more in line with International Financial Reporting Standards.
- **Data privacy.** In general, European Union data privacy laws are more restrictive than U.S. laws. The EU Data Protection Directive (which is being superseded by the General Data Protection Regulation) requires notification when a person's data is collected, then places additional restrictions on access and protection of that data.
- **Records retention.** Requirements for how long accounting records must be retained vary widely. It's five years in Poland, six in Germany, seven in Austria and 10 in the Dubai International Financial Centre. Certain Indian states require hard copies with original signatures for certain records and do not accept electronic copies.
- **Technology availability.** Most large organizations establish global hardware, software and cloud standards. But not every IT product is available in every country. Even when systems are available, adequate technical support may not exist. Moreover, different countries adopt new technology at different speeds. For example, some of the major Zambian banks still use Internet Explorer 7 or 8 and do not support IE10.
- **Licensing.** U.S., EU and Japanese organizations are careful to maintain properly licensed systems. Users in some other countries are more casual about licensing, arguing that they cannot afford licensing fees. Global organizations need to ensure that field operations are properly licensed.
- **Skill levels.** Basic IT proficiency varies widely, even within countries. India has excellent IT outsourcing firms with highly skilled employees. But on a recent trip there, I also saw administrative staffers who were using a computer for the first time. (One company had people who calculated sums by hand and then entered the results into a spreadsheet!)

If global enterprises ignore such constraints, local field offices may choose to operate two separate systems: one to comply with the home office's mandate, and one for day-to-day operations. Think of the waste, especially if duplicate data entry and system operations spin out of control. But you must distinguish between valid local constraints and frivolous requests. Accommodate the first and squash the second. In that way, you will bolster the field's opinion of HQ by being flexible but not foolish. ◆

Bart Perkins is managing partner at Louisville, Ky.-based Leverage Partners, which helps organizations invest well in IT. Contact him at BartPerkins@LeveragePartners.com.



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BIG DATA Blues

Big data might be big business, but overzealous data mining can seriously destroy your brand. Will new ethical codes be enough to allay consumers' fears? **BY CINDY WAXER**

MORE THAN SIMPLY BITS AND BYTES, big data is now a multibillion-dollar business opportunity. Savvy organizations, from retailers to manufacturers, are fast discovering the power of turning

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consumers' ZIP codes and buying histories into bottom-line-enhancing insights. In fact, the McKinsey Global Institute, the research arm of McKinsey & Co., estimates that big data can increase profits in the retail sector by a staggering 60%. And a recent Boston Consulting Group study reveals that personal data can help companies achieve greater business efficiencies and customize new products.

But while harnessing the power of data analytics is clearly a competitive advantage, overzealous data mining can easily backfire. As companies become experts at slicing and dicing data to reveal details as personal as mortgage defaults and heart attack risks, the threat of egregious privacy violations grows.

Just ask Kord Davis. A digital strategist and author of *Ethics of Big Data: Balancing Risk and Innovation*, Davis says, "The values that you infuse into your data-handling practices can have some very real-world consequences."

Take Nordstrom, for example. The upscale retailer used sensors from analytics vendor Euclid to cull shopping information from customers' smartphones each time they connected to a store's Wi-Fi service — a move that drew widespread criticism from privacy advocates. (Nordstrom is no longer using the analytics service.)

Hip clothing retailer Urban Outfitters is facing a class-action lawsuit for allegedly violating consumer protection laws by telling shoppers who pay by credit card that they had to provide their ZIP codes — which is not true — and then using that information to obtain the shoppers' addresses. Facebook is often at the center of a data privacy controversy, whether it's defending its own enigmatic privacy policies or responding to reports that it gave private user data to the National Security Agency (NSA). And the story of how retail behemoth Target was able to deduce that a teenage shopper was pregnant before her father even knew is the stuff of marketing legend.

Online finger-wagging, lawsuits, disgruntled customers — they're the unfortunate byproducts of what many people perceive to be big data abuses. According to a September 2013 study from data privacy management company Truste, 1 of 3 Internet users say they have stopped using a company's website or have stopped doing business with a company altogether because of privacy concerns.

Honesty Really Is the Best Policy

But IT professionals are discovering that balancing the power of sophisticated algorithms with consumer rights is about more than avoiding bad publicity or lost sales. These days, it pays to be honest — literally. "Organizations that are transparent about their use of data will be able to use that as a competitive advantage," predicts Davis. "People are starting to become very interested in what's going on out there with their data, so organizations that have practices in place to share that information ethically are going to be in a much better position to be trusted."

Yet many CIOs and data scientists are struggling with the question of how to derive real value and actionable insights from confidential data while still respecting consumers' rights and even earning their trust. As the store of data grows, and techniques for manipulating data multiply, some IT professionals are taking matters into their own hands with innovative approaches to preventing data abuse.

> **"If there's data known about you that's tradable between any two entities, it should be completely controlled by the consumer."**
>
> **OMAR TAWAKOL,** CEO, BLUEKAI

Retention Science is a perfect example. The Santa Monica, Calif.-based data analytics firm uses predictive algorithms and data such as aggregated household income, purchasing histories and credit scores to help companies predict a customer's purchase probability and build retention-marketing campaigns. In addition to the data supplied by a client, Retention Science also relies on the data it licenses from third-party providers to target the right consumers at the right time.

To create targeted campaigns while still respecting consumer privacy, Retention Science has established hard-and-fast rules governing its use of consumer data. For one, Retention Science refuses to share data across clients. For example, if Gap Inc. were a client, and had supplied Retention Science with consumer data, that information would never be shared — even anonymously — with other retail clients.

In another effort to preserve consumer privacy despite handling terabytes of confidential data, Retention Science insists that all of its data scientists, many of whom are professors and researchers, sign confidentiality agreements. "They are not allowed to share or use data anywhere else or for their own publications," says Retention Science CEO Jerry Jao.

In addition to holding its own employees accountable, Retention Science also "works only with businesses that are fully committed to getting their consumers' consent in advance to use their data," says Jao. "We don't want to include information from individuals if they didn't grant access in the first place."

Full Cookie Disclosure

While setting internal controls can help, you can go a step further by offering consumers a firsthand look at what's known about them. One company that has an open-book policy like that is BlueKai, a Cupertino, Calif.-based vendor that offers a data management platform that marketers and publishers can use to manage and activate data to build targeted marketing campaigns. In 2008, BlueKai decided to launch an online portal where consumers can find out exactly what cookies BlueKai and its partners have been collecting for them, item by item, based on their browsing histories.

Consider, for example, a woman who is shopping online for a red bicycle. As she visits different sporting goods sites that partner with BlueKai, a collection of anonymous cookies is stored on her browser. Based on this browsing history, BlueKai marketing partners will display behavioral ads on the woman's computer that are relevant to her bike-shopping quest.

These days, most online shoppers realize that it's not a coincidence when they see ads that are clearly tied to their browsing his-

tories. But the BlueKai Registry makes the process more transparent, and even allows visitors to opt out of the registry altogether or update their anonymous profiles by changing their preferences.

BlueKai CEO Omar Tawakol says the thinking behind the registry is that, "If there's data known about you that's tradable between any two entities, it should be completely controlled by the consumer." For this reason, BlueKai also encourages its partners to post private versions of the registry on their own websites to allay consumers' concerns and promote greater transparency.

"The beauty of what we do is we don't know who you are," says Tawakol. "We don't want to know anybody's name. We don't want to know anything recognizable about them. All we want to do is show you that your cookies are accessible, and that they have these attributes associated with them."

BlueKai isn't the only big data rock star that's handing out backstage passes. Marketing technology company Acxiom recently made headlines by launching AboutTheData.com, a free site where people can view some of the information the Little Rock, Ark.-based company has gathered about them. Details range from marital status to what kind of vehicle you drive. Visitors simply enter key personal information to find out what data advertisers are using to help tailor their marketing messages.

The fact that powerful data brokers such as Acxiom are helping to demystify data-driven marketing initiatives is no surprise to BlueKai's Tawakol. He believes that companies have no choice now but to respond to changing consumer sentiment around data privacy. "Years ago, people built data companies in the shadows where consumers had no control," he says. "It's a different age now — consumers should be in control."

Davis' perspective on the move toward greater transparency is more cynical. Noting that "organizations are starting to face increasingly close scrutiny around their data practices," he says companies have an ulterior motiving for coming clean about how they use information like ZIP codes and credit scores: Doing so helps them avoid legal entanglements and bad press. What's more, Davis says, many initiatives that are touted as offering people insight into how they're being tracked are more about public relations than full disclosure. "What they're still not telling me is who's buying that data and what they're doing with it," he says.

Policies Under Fire

Unfortunately, greater transparency doesn't always translate into greater understanding. The privacy policies of industry titans such as Facebook and Google have recently come under fire for being hard to understand and far too long to slog through. Presented as 70-page novellas filled with vague terms like "non-personally identifiable information," some policies have even sparked probes by regulators at the Federal Trade Commission.

In fact, the results of an April 2012 survey by strategic branding firm Siegel+Gale indicated that users have little understanding of how Facebook and Google track, store and share their information. Survey participants were asked to review Facebook's and Google's privacy policies and then rate how well they understood them on a scale of zero to 100 (with 80 indicating good comprehension). Facebook scored 39 and Google 36 — indications of poor comprehension.

"People don't understand what they're agreeing to," says Davis. "Organizations make it a lot more complicated than it should be." Besides, he adds, "reading all of the terms of services that we receive would take us 76 days a year."

That's not to suggest that privacy policies have no value in the world of big data. Rather, says Nans Sivaram, a client partner at IT consultancy and outsourcer Infosys, instead of sharing terms and conditions, companies need to "[communicate] the value consumers will receive if they part with certain information."

In a recent Infosys global survey, 39% of the respondents said

13 Commandments *for* Data Scientists

According to Michael Walker, a managing partner at systems integrator Rose Business Technologies, data scientists should be held to high ethical standards, just as doctors and lawyers are. Toward that end, he has created a set of commandments for number-crunchers — a list that aims to keep data scientists on the straight and narrow while preserving consumer privacy.

In Walker's view, data scientists shalt not do the following:

1. **Fail to use scientific methods in performing data science.**
2. **Fail to rank the quality of evidence in a reasonable and understandable manner for the client.**
3. **Claim weak or uncertain evidence is strong evidence.**
4. **Misuse weak or uncertain evidence to communicate a false reality or promote an illusion of understanding.**
5. **Fail to rank the quality of data in a reasonable and understandable manner for the client.**
6. **Claim bad or uncertain data quality is good data quality.**
7. **Misuse bad or uncertain data quality to communicate a false reality or promote an illusion of understanding.**
8. **Fail to disclose any and all data science results or engage in cherry-picking.**
9. **Fail to attempt to replicate data science results.**
10. **Fail to disclose that data science results could not be replicated.**
11. **Misuse data science results to communicate a false reality or promote an illusion of understanding.**
12. **Fail to disclose failed experiments or disconfirming evidence known to the data scientist to be directly adverse to the position of the client.**
13. **Offer evidence that the data scientist knows to be false.**

If a data scientist questions the quality of data or evidence, he must disclose this to the client. If a data scientist has offered material evidence and later comes to know that it is false, he shall take reasonable remedial measures, including disclosure to the client. A data scientist may [illegible] and label evidence he reasonably believes [illegible]

— CIO

that they consider data mining invasive. And 72% said they don't feel that the online promotions or emails they receive speak to their personal interests and needs. Yet, Sivaram says, "consumers are willing to part with personal information, provided there's good reason to."

The result is a high-tech Catch-22: On the one hand, consumers want to receive highly targeted and personalized products and services. On the other hand, they don't want to feel as if their personal data is up for commercial grabs.

"Retailers need to do a much better job of using the data that they already have to reach their customers," says Sivaram. "At the same time, they have to be careful about being seen as invasive because they don't want to get into trouble and lose the trust of their customers."

So what's the solution? According to Sivaram, the answer is for big data collectors "to establish the right incentives" for people to divulge their personal details. For example, by showing people that sharing their information can earn them loyalty points or discounts, companies can create greater value for their customers while converting consumer trust into a competitive advantage.

The same rule of reciprocity applies to online content as well. Says BlueKai's Tawakol: "When we have asked people in surveys, 'Would you prefer to pay for your content or would you prefer to have targeted ads alongside your content?' it's usually in the high 90% of people who would prefer sponsored content."

Setting a Code of Conduct

However, not everyone believes that the burden should be placed on consumers to blithely agree to share their data, decipher confusing privacy policies or swap credit scores for grocery coupons. For example, Michael Walker says that big data professionals should adopt a code of ethics. A managing partner at Rose Business Technologies, a Denver-based systems integrator and IT services provider, Walker has drafted a 12-page data science code of professional conduct covering everything from the role of data scientists to their daily responsibilities (see story, previous page).

"Companies are starting to understand the danger of secondary uses of information and how people's personal data can be abused," says Walker. "Once they start to think about it, they're very much in favor of an ethical code."

In fact, in an August 2013 survey conducted by statistical software company Revolution Analytics, 80% of the respondents said they agreed that there should be an ethical framework for collecting and using data. And more than half of data scientists surveyed agreed that ethics already play a big part in their research.

"My solution is to have some sort of code of professional conduct that data scientists would voluntarily agree to follow to protect people's private data," says Walker. By creating a kind of Hippocratic Oath for analytics professionals, Walker says data scientists will have both the moral and legal grounds for refusing to slice and dice numbers in ways that threaten to violate consumer privacy rights.

> **Companies are starting to understand the danger of secondary uses of information and how people's personal privacy data can be abused.**
>
> **MICHAEL WALKER,** MANAGING PARTNER, ROSE BUSINESS TECHNOLOGIES

Walker isn't the first to conceive of a code of ethics for analysts. Earlier this year, the Institute for Operations Research and the Management Sciences (INFORMS) drafted a code of ethics to accompany the launch of its Certified Analytics Professional (CAP) certification program.

Yet Davis believes that despite lofty intentions, it's far too easy for a code of ethics to wind up "written on a piece of paper and put in a drawer." The challenge, he says, "is that you have to get real about understanding what you actually do with your data and whether or not that aligns with the shared values in your organization." Unfortunately, he says, determining what your values are as an organization, and whether or not your data practices reflect these priorities, "is a very different conversation than what we're used to having in a business setting."

And then there are IT professionals who maintain that it's simply not a data scientist's job to protect privacy. Instead, "their job is to extract interesting insights from the data," says Ryan Kalember, chief product officer at WatchDox, a Palo Alto, Calif.-based vendor of security tools.

Market Will Drive Answers

Whether privacy is the purview of consumers, corporate executives or data scientists, one thing is certain: Data privacy is a hot-button issue. Even the U.S. government is investigating organizations that collect and manage big data and pressuring them to provide consumers with appropriate control over their personal data. But industry observers aren't holding their breath for sweeping governmental action. "It's not like the Founding Fathers are getting together in Philadelphia," says Davis.

The ongoing revelations about the NSA's Prism data-collection program have, if anything, further eroded the public's confidence that the government will do anything to protect consumers' privacy. Indeed, Tawakol says that shifts in consumer awareness about data privacy (or lack thereof) are more likely than federal investigations to drive reforms in data collection practices.

"The market will provide a mechanism quicker than legislation will," he says. "There is going to be more and more control of your data, and more clarity on what you're getting in return. Companies that insist on not being transparent are going to look outdated."

Walker shares that vision of the future. "There are lots of benefits to having data analyzed and having companies narrowly tailor specific products and services to customer preferences. But it's actually in a company's best interest to respect people's private data," he says, adding that companies are going to lose customers "if consumers find out that a company has been spying on them and using data in a way that's unethical." ◆

Waxer *is a Toronto-based freelance journalist. She has written articles for various publications and news sites, including* The Economist, MIT Technology Review *and CNNMoney.com.*

FORGET FINGERPRINTS:

YOUR IRIS IS YOUR NEW IDENTITY

Iris recognition finally seems ready to break into the mainstream, particularly in banking and law enforcement, as prices drop and systems get easier to use. **BY ROBERT L. MITCHELL**

AT THE ENTRANCE TO "THE VAULT," the most secure room within the most protected building operated by security services provider Symantec, an iris recognition system stands guard as the last line of defense.

Employees who make it this far have already swiped access cards and entered PINs at the building's main door, and then placed their fingers in a biometric reader to move beyond the lobby. But the high accuracy rate of iris recognition technology, which uses near-infrared cameras to take a picture of a subject's iris and then applies specialized algorithms to encode the image and match it to an existing record on file, makes it an ideal access control choice at this point. After all, this high-security area holds the cryptographic keys to Symantec's certificate authority business, which provides e-commerce security services to many organizations.

"We have to make sure that no individual can compromise those cryptographic tokens, [and] iris recognition has higher accuracy and less likelihood of false positives," says Paul Meijer, senior director of infrastructure operations at Symantec's identity and authentication division.

Symantec's use of iris recognition technology for an access control system in a setting where security requirements are high and cost is no object represents a classic application of the technology. But as prices have come down and the systems have become easier to use, the technology has been slowly gaining ground in more ordinary business settings in industries such as banking and healthcare.

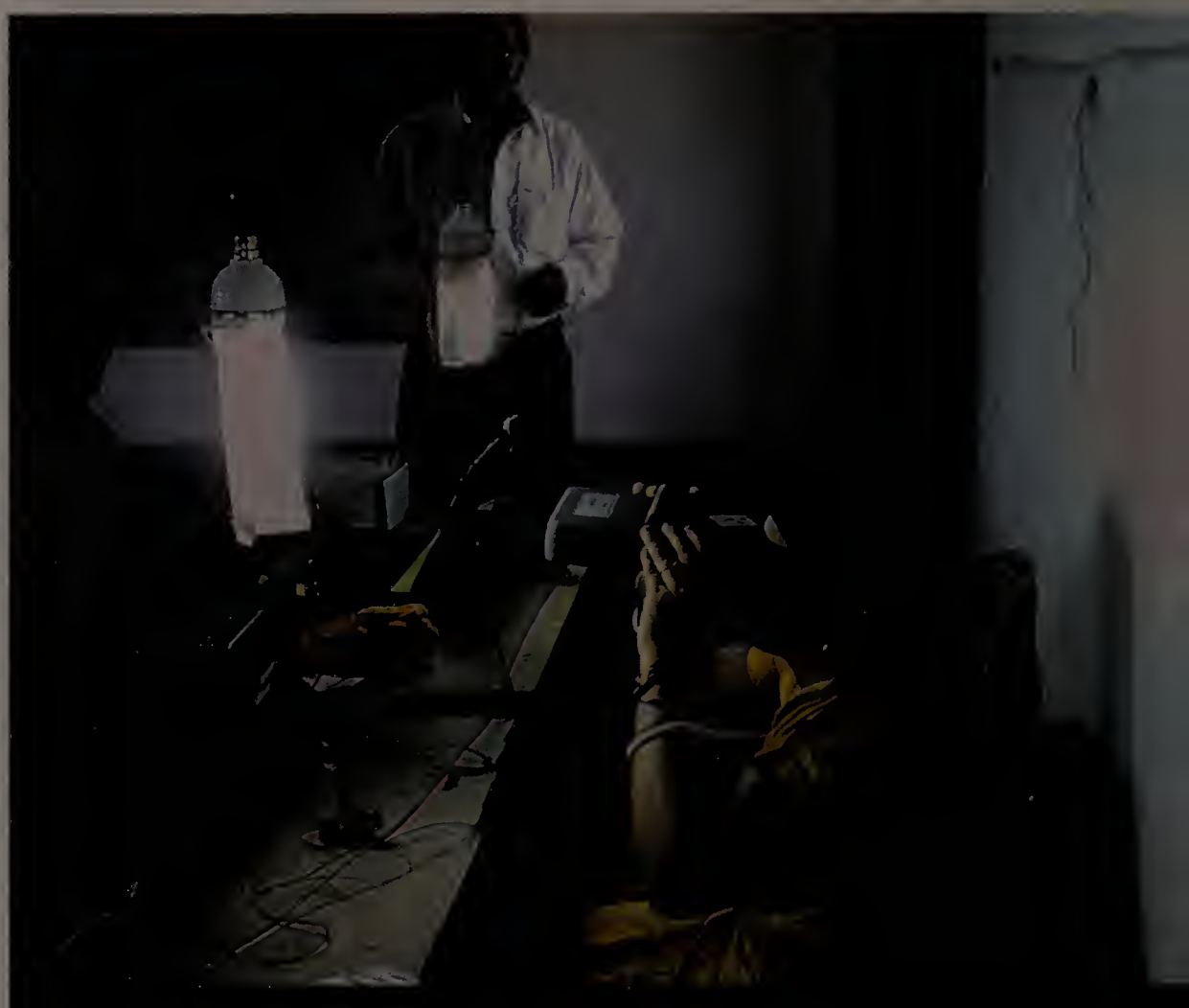
"Cost has perennially been an issue with iris, but this trend is quickly changing," as cameras, recognition algorithms and software have all improved, says Ram Ravi, a research analyst at Frost & Sullivan.

One reason for the rise in innovation that led to those improvements: the 2005 expiration of a key patent on the mathematical representation of the iris that previously limited what competitors could do. Since that time, open standards have been developed, says Patrick Grother, director of biometric standards and testing at the National Institute of Standards and Technology (NIST).

Until relatively recently, iris recognition systems were mostly deployed by governments, not by businesses, partly because they're so expensive. The largest use of iris recognition today is the Unique Identification Authority of India (UIDAI) project. That initiative, recently recognized by the *Computerworld* Honors Program, includes iris recognition as part of a national ID system designed to help provide social services for 400 million citizens.

The technology is now making its way to the consumer end of the spectrum. "The use of iris recognition in mobile phones is expected to see a considerable uptake," Ravi says.

AOptix Technologies, a maker of identity verification systems, recently released a software development kit for biometric identification technologies for Apple's iOS mobile operating system. That move, combined with the introduction of fingerprint biometrics in the new iPhone 5S and rumors of a biometric application for Google Glass, will serve to increase interest in all biometrics, including iris recognition, says Nandini Bhattacharya, a senior research analyst at Frost & Sullivan. "Apple, AOptix and Google Glass are just the beginning of this trend. Other mobile manufacturers are likely to soon follow," she says.



This binocular-style iris imaging camera, from Cross Match Technologies, requires the user to hold the camera directly in front of her eyes. Here the camera is being used as part of the world's largest iris-scanning initiative to date: the Unique Identification Authority of India.

Under the Lid

Unlike the retina scans you see in the movies, which shine a bright light through the pupil to capture images of blood vessel patterns at the back of the eye, iris recognition uses a camera to take a photograph of the iris — the colored portion of the eye.

> **Cost has perennially been an issue with iris, but this trend is quickly changing.**
>
> **RAM RAVI,** RESEARCH ANALYST, FROST & SULLIVAN

During fetal development, the eye goes through a process called chaotic morphogenesis that gives each iris its unique appearance. "When the optic nerve comes out of the brain, it essentially pumps out the eyeball, which rips and tears. Striations in the iris are the result of that," says Neil Norman, founder of Human Recognition Systems (HRS).

Iris recognition systems are extremely accurate; they're 100,000 times less likely to produce a false match than facial recognition systems, Grother says. Other benefits: The matching process is very fast and, unlike faces, the eye doesn't change much with age.

NIST recently completed a study on the subject of iris recognition. While face photos on passports are generally replaced every five to 10 years, "the iris is good for decades," Grother says. And because each eye has a unique pattern, vendors offer dual-eye systems, such as the one used in Symantec's Vault, for even higher accuracy. "Ten fingerprints are the gold standard for identification. A pair of irises are at least equivalent to eight or 10 fingers, and maybe more," Grother says.

But accuracy also depends on the integrity of the data, he cautions. While iris recognition technology doesn't require physical body contact (which is considered a plus), it does require the cooperation of the individual, and the type of system used can greatly affect accuracy. "If I take the image with a cellphone camera, the error rate will be much worse," Grother says.

Iris recognition systems need to overcome environmental issues such as reflections, bright sunlight, thick eyeglasses, colored contact lenses and eye conditions that may cause dilation or other changes in the iris. Today, "state-of-the-art iris recognition systems can deal with all of these," says Brian Martin, director of biometric research at MorphoTrust, a developer of identity verification systems.

Functionally, iris recognition cameras aren't much different from digital SLR cameras, except that the light filters over the sensors allow near-infrared light to pass through instead of visible light, says Martin.

Iris recognition systems encode the entire eye structure, following an open standard. And because the process doesn't focus on detailed feature points, a grayscale 640-x-480-pixel image is sufficient. That's one reason why the recognition algorithms can speedily process data and respond quickly. "The old VGA format turns out to be all you need. High resolution is not needed, and in fact would slow things down," says Grother.

This dual-eye camera guards the entrance to Symantec's "Vault." The LG IrisAccess camera moves to point itself at the user's eyes.

Sophisticated, high-end cameras capable of capturing images at distances of 2 meters can cost $30,000 or more, but other models suitable for business use that operate at close range may run as little as a few hundred dollars.

Banking by Eye

For Kamal Al-Bakri, who as general manager at Cairo Amman Bank oversaw the installation of an iris recognition system at 80 branches and 100 ATM locations in Jordan, fraud hasn't been an issue. "We've done more than a million transactions since 2009 with zero fraudulent transactions," he says. The bank recently upgraded to more-accurate dual-eye readers from IrisGuard in Buckinghamshire, England, "to sustain our position as a leader" as competing banks start to use similar technology, he adds.

In Amman, people must present a government ID when banking — a driver's license isn't sufficient — but not everyone remembers to bring their IDs when they make a trip to the bank. So Cairo Amman Bank gave its customers the option of registering with its iris recognition system and using it at both the teller window and at ATMs. Customers initially had concerns — some wondered whether the system would somehow affect their eyes, for example — so the bank issued a flier with answers to common questions. Today half of its customers use the technology.

The system isn't just more secure, Al-Bakri says; it's also more efficient. With iris recognition, the average time per transaction at the teller window is one minute versus four minutes using traditional authentication methods. As more customers opted for iris recognition, the bank found that it could reduce branch staffing levels from four tellers to two.

Speed and ease of use were key reasons why Gatwick Airport in London added a passenger authentication system that uses iris recognition technology a little more than two years ago. The airport has a departure lounge where both international and domestic passen-

HACKING THE IRIS

IS IRIS RECOGNITION VULNERABLE TO HACKS? While it's technically possible to create scenarios to fool iris recognition systems, Patrick Grother, director of biometric standards and testing at NIST, says pulling it off in the real world would be a challenge.

The possibility of spoofing iris recognition systems was addressed during a 2012 Black Hat conference presentation by Javier Galbally. In his talk (summarized in a story on the Electronic Frontier Foundation's website), Galbally argued that iris recognition systems could be fooled by synthetic images that match digital iris codes linked to real irises.

But the process described would require the hacker to steal a template or iris image for the person the hacker wanted to impersonate and then run an iris recognition algorithm against it repeatedly to produce a digital image that would match the eye of the person whose template was stolen, Grother says. "The paper did not address how to [steal] the biometric data or how to then present it to a system successfully," he says.

Another academic researcher, Oleg Komogortsev at Texas State University, argues that it's possible to take a picture of someone's iris from a distance, create a high-resolution printout and successfully present that to an iris recognition system.

Komogortsev advocates for an alternative approach based on tracking eye movements instead of using a still photo of an iris. But Grother says that the cameras themselves have countermeasures designed to detect paper-based photographic images. And under real-world conditions, eye tracking is difficult. For example, pictures often contain reflections from ambient light on the eye, and you get very little detail for people with brown irises, which absorb light. That's why developers of iris recognition systems use specialized cameras designed to use near-infrared illumination instead of natural light, he says.

— ROBERT L. MITCHELL

THINKSTOCK

gers congregate prior to boarding. "We had to ensure that people who are traveling domestically stick to their flights and don't swap tickets," says David Rees, IT program lead at the airport.

Now users scan their boarding passes at the security gate, and a video system on a "bio pole" tells them where to look as a camera takes a facial photo and an iris image from a distance of up to 2 meters (6.5 feet). Once the self-service process has completed, the gate opens automatically. The system then uses the iris data to authenticate passengers at each gate as they line up to board their flights.

The system handles as many as 3,000 people per hour during peak times, and an average of 30,000 to 35,000 people each day. "It's very effective," Rees says. The airport just completed a revamp of the system, provided by HRS, integrating it with an enterprise service bus that exchanges data in real time with other systems used to check flights and passengers. "It's not just sticking some cameras onto a pole," he says. "There's a lot of infrastructure that needs to be in place."

The cost of cameras for an application like the one at Gatwick can range from $10,000 to $65,000. Gatwick's system uses AOptix InSight models, and the airport has 34 of them, says HRS's Norman.

The system works by automatically locating a passenger's face and capturing the iris pattern while the video offers simple instructions, such as "Please look up" and "Please stand still" and "Please proceed," according to Rees.

At Symantec, Meijer says the closer-range binocular-style cameras used in the latest version of its iris recognition system have also improved considerably. "Before, you had to manually adjust the mirrors to line up with your eye," he explains. "Now it remembers you when you scan your badge. It's more user-friendly."

Iris-centric Law Enforcement

While most organizations use iris recognition as an additional authentication resource, law enforcement agencies in Missouri have made the technology central to everything they do. Missouri was the first state to use iris recognition as the core platform on which to build a statewide law enforcement records management and jail records management system for tracking people as they pass through the criminal justice system,

> **"It's not just sticking some cameras onto a pole. There's a lot of infrastructure that needs to be in place."**
>
> **DAVID REES,** IT PROGRAM LEAD, LONDON'S GATWICK AIRPORT

says Mick Covington, director of the Missouri Sheriffs' Association.

The new system, purchased from MorphoTrust and used by sheriff's offices and the Missouri Department of Corrections, starts tracking people the moment they're arrested and booked.

"When someone comes into one of our jails, you get a read back in three seconds that tells you who they are and where they were last," Covington says. Deployed in 55 of the state's 115 counties to date, the system is used by county jails to, for example, identify people, check them in and out for court dates, and make sure medication is delivered to the right person at the right time.

The system will eventually upload iris data to a state repository that will in turn upload the data to the FBI's Next Generation Identification (NGI) database. The fact that the system doesn't require touching the individual is an advantage in a prison setting, Covington says, and the technology requires minimal staff training. "The quality of the images is much better now," he says. "And the machines are more user-friendly and more durable. They're cop-proof."

Iris recognition technology is continuing to evolve and outgrow its spy novel image, as is the manner in which users interact — or don't interact — with the systems. The technology is moving beyond what HRS's Norman calls a "coerced method of acquisition" — exemplified by the types of systems historically used at border crossings and in prisons — to a more social technology. "Social is if I go to a store and take a soda from a machine using a biometric," he says. "We're on the edge of moving into a personalization stage and away from this security/paranoia type of application. That's the next phase." ◆

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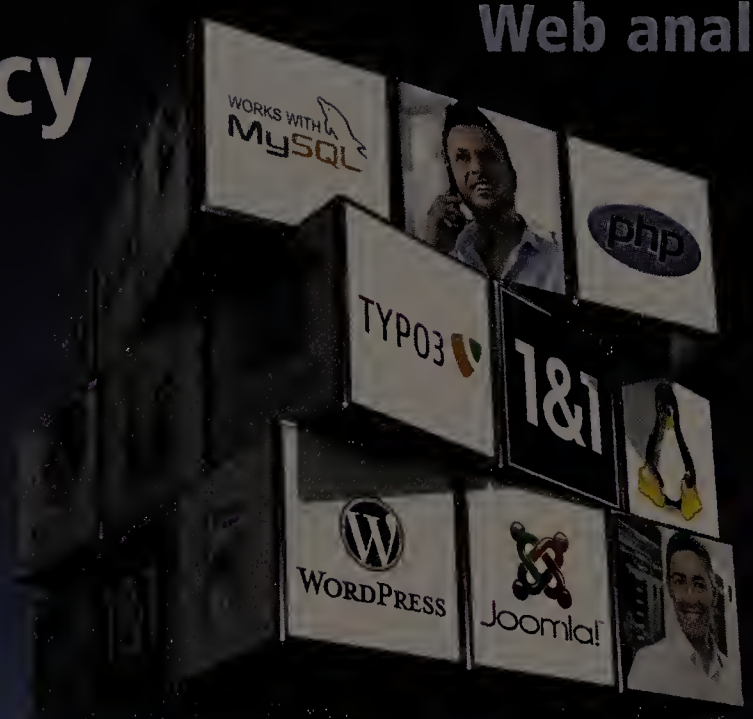

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YOUR TEXT RESUME *is* so Last CENTURY

Goodbye, boring curriculum vitae. Today's tech résumés are tricked out with video, social and graphic elements.

BY MARY K. PRATT

TIM ONDREY has glimpsed the future of the job-search market, and it's going multimedia.

One of his friends used a blog and a 30-second video to apply for a marketing job, and another, an IT colleague, interviewed via Skype for a developer position.

THINKSTOCK

Ondrey figures it's just a matter of time before he — and everyone else — uses more than just an old-fashioned résumé to land a job.

"I'm kind of nervous about it, but we're all going to be in that same boat, figuring out what works and what doesn't," says Ondrey, an active member of the IBM user group Share. An applications report specialist at Marist College in Poughkeepsie, N.Y., Ondrey isn't currently looking for a job, but, like a lot of people, he keeps an eye on the market.

What he's seeing is that video, graphics and social media are becoming part of the job-search landscape. Recruiters and hiring managers say younger workers, who grew up online and use FaceTime more than landlines, are more apt to show off their assets via personal websites, blogs, videos and online portfolios with embedded examples of current work and links to online communities in which they're active.

It's no coincidence that LinkedIn recently began encouraging its users to amp up their profiles with videos, illustrations, photography and presentations. And Toronto startup Vizualize.me has attracted 200,000 users to its tool, still in beta, that turns text-based résumés into online infographics.

"People are open to new formats, new ways of presenting credentials," says John Reed, senior executive director of Robert Half Technology, an IT staffing firm based in Menlo Park, Calif. "People are trying to figure out how to stand out in the crowd, how to bring life to their profile and experience, and they're using social media tools to do that."

Reed says that neither he nor his colleagues have seen many applicants submit videos yet. And the videos they have seen function more like cover letters than résumés. "The videos are, 'Let me introduce myself before you look at my résumé,'" Reed says. "The companies look at it and say, 'That's cool, that's an interesting twist, that makes the candidate stand out.'"

That's the thinking at Hire IT People, a Washington-based staffing firm. Owner Dan Nandan says Hire IT People is turning to videos as a way to showcase its IT talent.

"We felt they'd have a more powerful impact if a video résumé was submitted" in addition to the traditional paper CV, Nandan says. "And it's working," he adds, explaining that well-done videos presenting candidates' skills and background "definitely make a big impact."

Nandan recently worked with Neeraj Uppal, an IT project manager who had made a video in which he talked about his background. The Hire IT People staff used the video to evaluate Uppal and were impressed enough to recommend him to a client company. That led to the conventional application process, with Uppal sending a text résumé, then interviewing and getting the job, a contract position.

People are trying to figure out how to stand out in the crowd, how to bring life to their profile and experience, and they're using social media tools to do that.

JOHN REED, SENIOR EXECUTIVE DIRECTOR, ROBERT HALF TECHNOLOGY

"I don't know if he was hired based [only] on the video, but it made an impression," Nandan says. "It gets people's attention. If I get 50 emails, and there's one that says, 'Please watch my video,' I will watch the video first."

Video can also function as a second chance for IT hopefuls whose résumés might otherwise be rejected by scanning software looking for specific keywords to quickly — if not always accurately — match people's qualifications with open positions. Those candidates might be able to catch a hiring manager's eye with a well-crafted video pitch (see box, next page).

Video Interviews, Pros and Cons

Video is more than just a résumé enhancer; it's playing a larger part in the entire hiring process. For example, many companies now conduct first-round interviews via Skype or other videoconferencing technologies, rather than holding in-person meetings, to save time and money while still getting a sense of candidates' interpersonal qualities.

Some companies also screen candidates by asking job applicants to record and submit videos in which they answer specific questions. "That's where I've seen a greater evolution on the video side, because the convenience factor is tremendous," says Dan Pollock, a senior vice president at tech staffing firm Modis.

> **There is no replacement for face-to-face interviews. ... But video is a very powerful format.**
>
> **JENNIFER TAYLOR,** SVP, APPIRIO

Modis acts as a middleman in the video screening process. Typically, a hiring company comes up with five to 10 questions and passes them on to Modis, which invites candidates to its offices to record videos in which they answer the questions. Some candidates choose to record the videos on their own, but Pollock says Modis can ensure that the audio and visual quality are up to par when it handles the recording. The firm uses a hosted system from HireVue that allows Modis to set a time limit for each response (three minutes) and control the number of retakes (one).

Hiring managers can then view the videos at their convenience. "It's much more tailored to the position that they're trying to fill," Pollock says, adding that the videos also show hiring managers whether candidates know their stuff, can think on their feet and can communicate concisely.

Others say video interviews — either live or prerecorded — help hiring mangers winnow out candidates who might have Googled answers during phone interviews, as well as those who lack interpersonal skills, which are important for IT professionals who interact with customers, corporate executives or the public.

On the other hand, some point to potential problems with using video to screen candidates. Some employers wonder if it would leave them more vulnerable to charges of discrimination, since they could more easily see traits (age or ethnicity, for example) that they shouldn't use to eliminate candidates. Other IT industry watchers worry that use of videos could lead hiring managers to favor job candidates with good presentation skills, even if they're filling jobs that don't necessarily require such skills. After all, coders don't need to come off well on camera to do a bang-up job.

Reed says such concerns keep many employers from using video. "Companies don't want to be susceptible to accusations," he says. He points out that candidates, too, often hesitate to use these tools because they're worried about where their videos will reside and for how long.

Résumés With Graphic, Social Flourishes

Those concerns aside, video is undoubtedly becoming more prevalent in the IT hiring process. It's just one of the multiple new formats and platforms that job hunters are beginning to utilize. "The résumé hasn't changed in 40 years. It just feels like it's time for it to evolve, and technology is at a place where it's helping us evolve it," Pollock says.

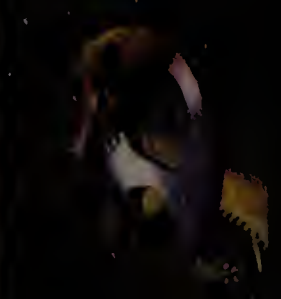
Pollock says he's seeing candidates successfully use graphics to represent skill sets, responsibilities and accomplishments on, or as a supplement to, text-based résumés. Some IT professionals, particularly Web designers or UI and UX professionals, maintain online portfolios or submit links to their work.

Others, such as developers, point to their contributions to open-source communities like GitHub. And, of course, job hunters ignore at their peril the reach of LinkedIn and, to a lesser extent, other social media sites like Facebook, Google+ or even Instagram.

"[Hiring companies] want to see what people are doing within the tech community, the development space — are they contributing? So I encourage people to have a strong digital profile as well as a résumé. And LinkedIn is the primary tool for a strong digital profile," says Doug Schade, principal consultant in the software technology search division at WinterWyman, a Waltham, Mass.-based recruiting firm.

Schade says savvy candidates know how to leverage social

VIDEO DO'S & DON'TS



If you plan to submit a video as part of a job application or online profile, or if you've been asked to take part in an interview via videoconferencing, here's what you need to think about before you turn on that camera:

- **Keep it short.** Hiring managers who don't have time for multipage résumés won't have time for lengthy videos or rambling responses.
- **Pick a professional, quiet spot.** Stay out of Starbucks. And your bedroom.
- **Have a solid or bland background.** Check behind you for distracting artwork, offensive material and unkempt home offices. (Hiring managers say they have indeed seen all of those during video interviews.)
- **Maintain eye contact by sitting still and looking into the camera.** Don't fidget or multitask. Such behavior wouldn't fly in an in-person interview, so it wouldn't be acceptable in a video interview or presentation.
- **Dress as you would for a face-to-face interview.** For those who need reminding, that means business attire suitable to the position and the company's culture.
- **Guard against interruptions.** Shut off your phone. Give the dog a bone, and make sure no one comes knocking at the door.
- **Don't forget to smile.**

MARY K. PRATT

media to separate themselves from the pack. They don't just paste traditional résumés into their LinkedIn profiles but rather focus on showcasing themselves with links and presentations that highlight their skills and accomplishments.

"There is an opportunity to be more robust with one's persona," Schade says, "because social media is used by hiring managers to gain more intel, gain more insight."

Web developer Avery Anderson, 27, gets that. A 2008 graduate of the Franklin W. Olin College of Engineering in Needham, Mass., Anderson holds a degree in mechanical engineering, but she decided that wasn't the best fit for her after working in the field for a year.

Anderson did some contract work in robotics, and then in February 2010 she sought out a Web engineer position at an Internet startup for wine aficionados called Second Glass. "Web development seemed like a huge opportunity, but I didn't have a lot of experience, so I started with a personal website. It was like, 'See, I can make a website.' That got me in the door," says Anderson, who was hired right away.

When she left Second Glass in April 2012, Anderson turned to her website again, updating it to reflect more of her skills and personality. She says her site, along with her LinkedIn profile and her account at GitHub, got plenty of traffic; she estimates she was contacted by about 50 recruiters during her two-month job search, and those contacts led to nearly 10 interviews — including some Skype sessions.

Anderson landed a software engineer job with Minerva Project, a startup that's building an elite online university. Although she was introduced to the organization through a roommate, she says she knows the company checked her out online before she even walked in the door. "People Internet-stalk everyone before meeting in person," she says.

And even though she's not looking for a new job now, she maintains her personal website to provide what she calls "a landing page" for people who want to know more about her and her work — and that's particularly important because she's trying to gain more experience, recognition and speaking engagements.

"It's not just about what jobs you get. Every time you do things like that and work your way into the community more, you make yourself more valuable as an employable person, you build your reputation," she says.

Ondrey, the Marist College applications report specialist, says he and his colleagues are getting that message, so they're beefing up their online professional presences by posting or tweeting articles they find interesting along with their own commentary. They're updating their lists of skills and responsibilities on their résumés more frequently. And they're adding videos — both their own and others that are relevant to their field of interest.

That fits with what's happening at Appirio, a San Francisco-based cloud technology company with 650 employees globally.

"We have definitely seen more candidates modify their résumés to include links to their social media profiles," says Jennifer Taylor, Appirio's senior vice president of HR. Résumés now include Twitter handles and links to LinkedIn profiles and blogs.

The process works both ways, Taylor says; she and her colleagues use social media to reach out to potential prospects. "Often we have found that it's through a Twitter conversation that one of our employees will identify someone in the ecosystem who is contributing unique ideas or products," she says. "We use those as an opportunity to say, 'Look at what this person is doing, we should start a conversation with this person.'"

And while Taylor says she hasn't yet received a video résumé, she and her hiring managers use video to promote the company to prospective employees and to interview candidates — something they do live using Skype, Google+ and occasionally GoToMeeting.

"We still believe that there is no replacement for face-to-face interviews, and we do make that a requirement before anyone is hired. But video is a very powerful format," she says. "It makes information about our company as available as possible, and it gets people familiar with us. It creates some rapport right off the bat. The candidate feels like they're getting to know us, and vice versa." ◆

Pratt *is a* Computerworld *contributing writer in Waltham, Mass. You can contact her at marykpratt@verizon.net.*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Security Manager's Journal

MATHIAS THURMAN

Found: Servers That Shouldn't Be

They're Internet-facing, unpatched machines with no malware protection. How could that ever happen?

WE JUST found 30 servers that can't be accounted for. Thirty Internet-facing servers with no malware protection and patchy patch histories. I need to take a deep breath and figure out just how bad this is and what we can do to stop this sort of thing from happening again.

This came to light because I collect metrics that I can present to our CIO during his quarterly business review. Among them is our number of unmanaged resources. That's a number that we always want to see decreasing. Total elimination of unmanaged resources is probably beyond our reach, but I at least want to contain them to our development environment and keep them out of the DMZ, that portion of a network that exposes applications and infrastructure to the world. Our production environment is behind a firewall that protects it from the R&D network, which I call the "Wild, Wild West."

We've tried to get the folks in the R&D organization to manage their resources better, but they have so many isolated requests that they can't keep on top of things. Rather than fight a battle we can never win, we just put those R&D resources behind their own firewall and impose rules that restrict what those resources can do and where they can go. To compensate for that, and since I believe that you're only as strong as your weakest link, I strongly emphasize configuration management of our production network, with a 100% compliance goal for our Internet-facing resources.

The metric on unmanaged resources is created by conducting Nessus scans and matching those numbers up against what our operations folks tell us they are managing. The difference is the number of unmanaged resources. Naturally, I was stunned when a Nessus scan turned up 30 Internet-facing servers that didn't appear on our corporate systems management console. Once I picked my jaw up off the floor, we reviewed the servers manually. Besides the malware and patching lapses (no updates in more than six months), we found that some of these unmanaged resources were Linux servers with source-code compilers on them. Some of them had default services running that are risky at best, such as Telnet and FTP.

the discussions about security! **computerworld.com/blogs/security**

"Some of the unmanaged resources were Linux servers with source-code compilers on them.

So who is running these servers? An email to everyone in IT asking that question got no response. OK, then, let's deactivate the servers' switch ports and see who comes running. It took more than three days, but finally someone from one of the business units called IT operations. It turns out that the business unit had provisioned the servers to run a proof of concept for a customer. The unit was able to do this because one of its admins used to be a member of the IT department, and he still had access to Lab Manager, the centralized administration server used to spin up virtual machines. The admin said he thought Lab Manager only positioned servers on the R&D network and not the DMZ.

So there's no bad guy in this story, but we clearly have some process shortcomings. The password for Lab Manager should have been changed when the admin left the IT department, according to our policy. We had undocumented servers with customer data on them, which is against our policy. Why was there no email alert or other notification from Lab Manager that servers had been provisioned? I also want to find out why the provisioned servers weren't installed with our predefined baseline image, which would have installed our systems management software, patches and antivirus software, and hardened the operating system.

One other question comes to mind: Why didn't our security information and event management system alert us that there were new IP addresses in our DMZ? I'll definitely look into that one. ◆

This week's journal is written by a real security manager, **"Mathias Thurman,"** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

Trouble Ticket

» There are 30 unmanaged servers running in the DMZ.

» Find out who's responsible and how and why it happened in an effort to avoid anything similar occurring.

S.J. VAUGHAN-NICHOLS

More Windows Fail

> The heart of the problem with Windows 8.1 is it's still two operating systems in one.

HAVING SEEN WINDOWS 8.1, I have a question I'd like to ask Microsoft: "Is that the best you could do?"

My assessment: Windows 8.1 doesn't suck as much as Windows 8. If you felt, when using Windows 8, as if you were banging your head against a brick wall, Windows 8.1 might feel as if you're banging it against a wooden wall. Much better, right? Of course, someday you might ask yourself why you need to bang your head against a wall at all.

Let's start with Start. Yes, we've all heard that Microsoft is bringing the Start button back, responding to all those users shrieking about its disappearance. So that's better, right? Not so much. All that the new Start button does is bring up the touchy-feely Metro — uh, I mean, Modern — no, wait, make that "Windows 8 Store apps" interface. Is it any wonder that Lenovo bundles the Pokki Start button and menu replacement software with its Windows 8.x machines?

About that interface name: Windows 8 Store apps. Really? Could it be any lamer? Tell me, is there any way Ballmer can be shoved out the door faster?

But here's the heart of the problem with Windows 8.1: It's still two operating systems in one. There's the blocky Windows 8 Store — oh, the heck with it, I'm just calling it Metro — and then there's the Windows desktop interface, which kind of looks like Windows 7 Aero. I don't know about you, but I always love using two interfaces to do one job.

So, you ask, is anything better in this update? Well, the Metro apps tend to be better.

Yep. That's about it.

I've yet to meet anyone who actually uses Metro apps. *InfoWorld*'s Windows expert, Woody Leonhard, confesses that he "hates" Windows 8.1. His guide to supercharging Windows 8.1, he freely admits, is mostly about "Metro back-off." Talk about damning with faint praise!

The fact that Windows 8.1 offers no real improvements is sad, but the story is worse than that. It actually comes with all-new problems. High-end mice won't work well with it. If you wisely skipped Windows 8 but now want to "upgrade" from XP, Vista or Windows 7, you will not get any of the promotional price discounts that accompanied the Windows 8 rollout. If you're a small business owner and you updated your systems to Windows 8, the update is free, but guess what: You'll need to update each PC individually. That's right: You'll need to manually go to the Windows Store from every PC or tablet and download the 3GB Windows 8.1 file. Yes, upgrade to Windows 8.1 and relive the worst of the '90s. Here's a quote from Andre Da Costa, a Microsoft vice president and Windows peer-to-peer support forum moderator: "The Windows Store is the only way for consumers (non-enterprise, non-IT Pro) to download and install Windows 8.1. No ISOs will be made available, so each device needs to be updated individually via the Windows Store."

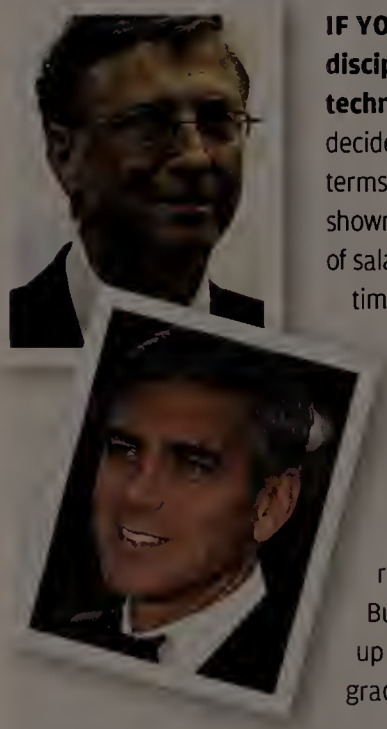
Let's sum up: If you hated Windows 8, you're going to hate Windows 8.1. If you're at a small business, you're going to hate Windows 8.1. If you're at a large enterprise, you still have no reason to make the move from XP or Windows 7 to 8.1.

Are any of you ready to say, "Enough already"? There are alternatives, including Google's Chrome OS, tablets using Android and iOS, and Mac and Linux desktops. I don't know where Microsoft thinks it's going — neither does it, until it picks a new CEO — but it's nowhere anyone who wants a good business desktop wants to go. ◆

Steven J. Vaughan-Nichols has been writing about technology and the business of technology since CP/M-80 was cutting-edge and 300bps was a fast Internet connection — and we liked it! He can be reached at sjvn@vna1.com.

Career Watch

IT: You Don't *Have* to Be a Star



IF YOU'RE STUDYING computer science or a related discipline, we hope it's because you love working with technology. But it's always good to know that the field you've decided on will be rewarding in monetary as well as emotional terms. Several compensation studies over the years have shown IT to be a reliably well-paid sector, and a new survey of salaries in the U.S. confirms that finding, while at the same time showing some interesting contrasts with other fields.

The study in question is the **2013-2014 PayScale College Salary Report**. It looks at how things like your major and your school can be expected to affect your earning power. It was interesting to note that seven IT-related majors show up in the top 30 (out of 129 majors listed) in a ranking based on average midcareer salary. (See the breakout list at top right for details.) But it's also interesting to see where other majors show up on the list. Some that might seem guaranteed to put a graduate on the road to riches don't make the top 30.

SALARY POTENTIAL

Rankings for [illegible]

Major	Average starting salary	Average midcareer salary
[illegible]	$65,300	$106,000
[illegible]	$59,800	$102,000
[illegible]	$60,500	$99,300
[illegible]	$53,800	$92,200
[illegible]	$50,800	$87,400
[illegible]	$51,900	$87,200
[illegible]	$49,900	$84,100

SOURCE: PAYSCALE SURVEY OF 1.4 MILLION U.S. WORKER[illegible] ELOR'S DEGREES AND AT LEAST 10 YEARS OF EXPERIENC[illegible]

In some cases, that's probably because we associate certain careers with its stars, but most of those who pursue majors that would prepare them for those careers fall well short of that status in the end. An obvious example is the entertainment field, whose stars are glaringly visible. But majors related to entertainment rank fairly low (theater, No. 96; drama, No. 107; radio and television, No. 99), which suggests that most of the people going out into the world with one of those degrees are not stars, and they aren't making as much money as your average code jockey. And of course, we all know that most actors actually get by doing things like waiting tables. Other careers that probably are attractive because of the rewards that accrue to their stars are advertising (No. 44) and architecture (No. 51).

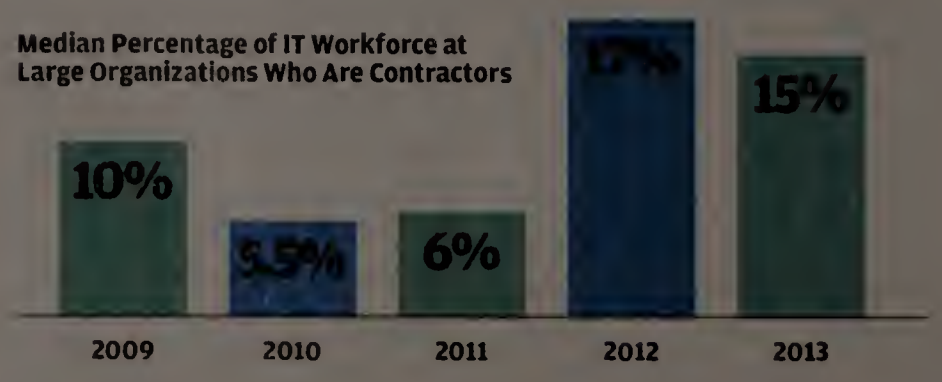
Of course, IT has its stars too. People who studied (but did not necessarily complete degrees in) those seven IT-related majors include tech luminaries like Bill Gates, Mark Zuckerberg and Sergey Brin. But in the IT field, as in the other majors clustered at the top of this survey, you don't have to be a star to do well.

– JAMIE ECKLE

CONTRACTORS: Partying Like It's 1998

The ratio of IT contract workers at large organizations spiked last year and remains high in 2013, at a level not surpassed since 1998. That was the height of the Y2K contracting boom and the first big Web development push. Today's boomlet is probably fueled in large part by initiatives revolving around big data and mobile apps.

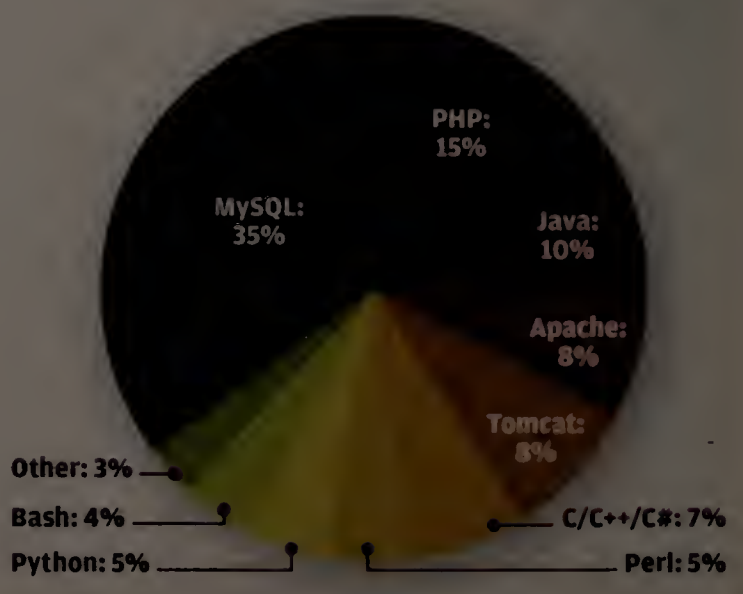
Median Percentage of IT Workforce at Large Organizations Who Are Contractors



SOURCE: COMPUTER ECONOMICS SURVEY OF 200 IT ORGANIZATIONS WITH OPERATIONAL BUDGETS OF AT LEAST $20 MILLION, OCTOBER 2013

In-Demand Linux Skills

LinuxCareer.com did an analysis of job postings to determine which Linux skills are most sought by employers right now.



DTS NACHRICHTENAGENTUR / NICOLAS GENIN

With 100+ branch offices located across the US, Experis US, Inc., is actively recruiting for the following positions. Roving employment to varying jobsites throughout the US. EOE/MF/DV. Metro Milwaukee WI - Sr. J2EE Architects - Code #MKE270; EA Architects - Code #MKE280; Econometric Modelers - Code #MKE290; Liferay Portal Administrators - Code #MKE300; Mainframe Programmer Analysts - Code #MKE310. Manpower US, Inc., is actively recruiting for the following position. Sr. Acct. Representatives - Code #MI240. Refer to appropriate job code when submitting resume to: Experis/Manpower US, Inc., Attn. Robin Block, 100 Manpower Place, Milwaukee 53212.

Nisum Technologies, has multiple openings for the following positions at its office in Brea, CA.
•Technical Lead: Design, develop and test software systems.
• Sr. QA Engineer: plan and conduct analysis, inspection, design, test and/or integration to assure quality of projects.
• QA Engineer: Assist in analysis, design, test and/or integration of projects.
• Sr. Application Developer: design, develop, maintain & test software applications/systems. Analyze customer requirements & custom design systems as needed.
• Database Administrator: Install, maintain, administer & troubleshoot databases.
• Programmer Analyst: Analyze, develop & write codes to implement system applications.
Job requires min. of M.S./foreign equiv. + exp., M.S./foreign equiv., or B.S./foreign equiv. + exp.. Education/Experience requirements vary depending on position level/type. Travel/relocation required. Send resume and salary history & position applied for to: Nisum Technologies, 500 S. Kraemer Blvd., Brea, CA 92821. Attn: H.R. Manager.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 Attn: D. Racherla. Please reference job # below:
Software Engineer Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp. incl:
#1615.5081; C++ & Java; large syst sw design & dvlpmnt; Unix & Linux; high avail distrib syst & related ntwrk prog; & multi-thread srvr arch.
#1615.2781; design, implement, test, & maint of moderately complex subsyst; proactive, analytical prob solving; data struct & algorithms; dvlpmnt of highly-scalable srvr-side algorithms utilizing Java, XML, HTML, & multi-thread prog; test techniques & test frmwrks; & Unix or Linux.
#1615.1719; data struct, algorithms & mach learn; analyzing & troubleshoot large-scale distrib syst; IP ntwrkng, ntwrk analysis, & perf & application issues using stand tools; & UNIX syst admin, incl scripting.
#1615.697; Java & Java App dvlpmnt; C & C for Linux; & mobile sw dvlpmnt & embedded syst prog.
#1615.3371; C & C++; Java; Python; SQL; HTML; & MapReduce Frmwrk.
#1615.4094; algorithms & data struct; probability & stats; data mining & data analysis; mach learn; C++ & Python; & dvlpmnt of frontend & data visualization tools.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: D. Racherla. Please reference job # below:
Business Systems Integrator (NY,NY) #1615.3912: Design analytical solutions that answer complex business decisions. Exp incl: sw dvlpmnt life cycle & sw testing lifecycle; application of sw test techniques, processes, & tools; Java; creation of pltfrm components; dvlpmnt of sw syst; design & implement desktop & web apps; OOP; HTML, CSS, Jscript, & XML; SQL; & soapUI.
Software Engineer Positions (NY, NY) Design, develop, modify, and/or test software needed for various Google projects. Exp incl:
#1615.2192 speech recognition & process; stat modeling; mach learn; pattern recognition; algorithms; C, C++, & Java; & parallel & distrib computing.
#1615.6722 process large datasets; research exp in data clustering or distrib computing; dvlpng web srvcs using Java Servlet Engine & GWT; & dvlpng ad sw syst.
#1615.7509 UNIX; C++ & Java; Python; data struct & algorithms; sw design; sw refactoring; & test, version control, & release mgmnt.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 Attn: D. Racherla. Please reference job # below:
Data Scientist (Mountain View, CA) #1615.6266 Turn and integrate ideas and research results into products. Exp incl: mach learn; stats; data mining; & coding in Java, Python, or other OOP lang.
Software Engineer in Test positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp. Incl:
#1615.7124: design, implement, test, & maint of large scale distrib syst; design & implement of build & test infrastruct; & design & dvlpmnt of effective test solutions.
#1615.3891 sw eng'g, C++ or Java; test automation dvlpmnt; JUnit or gUnit; con't build syst dvlpmnt; & app profiling.
Software Engineer Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp. incl:
#1615.7014: Obj-C &/or C++; mobile app dvlpmnt; & unit test.
#1615.5927 C & C++ multithread; Python; parallel & distrib compute; & mach learn algorithms.
#1615.7588 design of large scale distrib syst, distrib file syst, & distrib database syst; design of fault tolerance & recovery methods for distrib syst; prob & perf analysis of large scale distrib syst; C++ & Python; multi-thread prog; debug; & sw test.
#1615.7613 Java; UNIX or Linux; OO tech; database design & SQL; large-scale data index & process; design & dvlpmnt of large & distrib syst; web tech; & data struct, algorithms, & sw design.
#1615.7310 C++, Java, Perl, & Python; MySQL; Windows, UNIX, & Linux; algorithms, data struct, & distrib syst; & TCP/IP, HTTP, & HTML.
#1615.5639 C & C++; Python; Linux, incl Linux Kernel dvlpmnt; multithread prog; distrib syst prog; TCP/IP & OSI ntwrkng stacks; design & dvlpmnt of sw tests; & load, perf, & funct test.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: D. Racherla. Please reference job # below:
Software Engineer in Test (San Francisco, CA) #1615.683 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: Python & C++; Android dvlpmnt; oper syst implement; QEMU &/or other emulator tech; Android SDK tools; test driven dvlpmnt; & Android syst internals & their Interactions w/apps.

BlackBerry Corporation, Redwood City, CA, positions are available:
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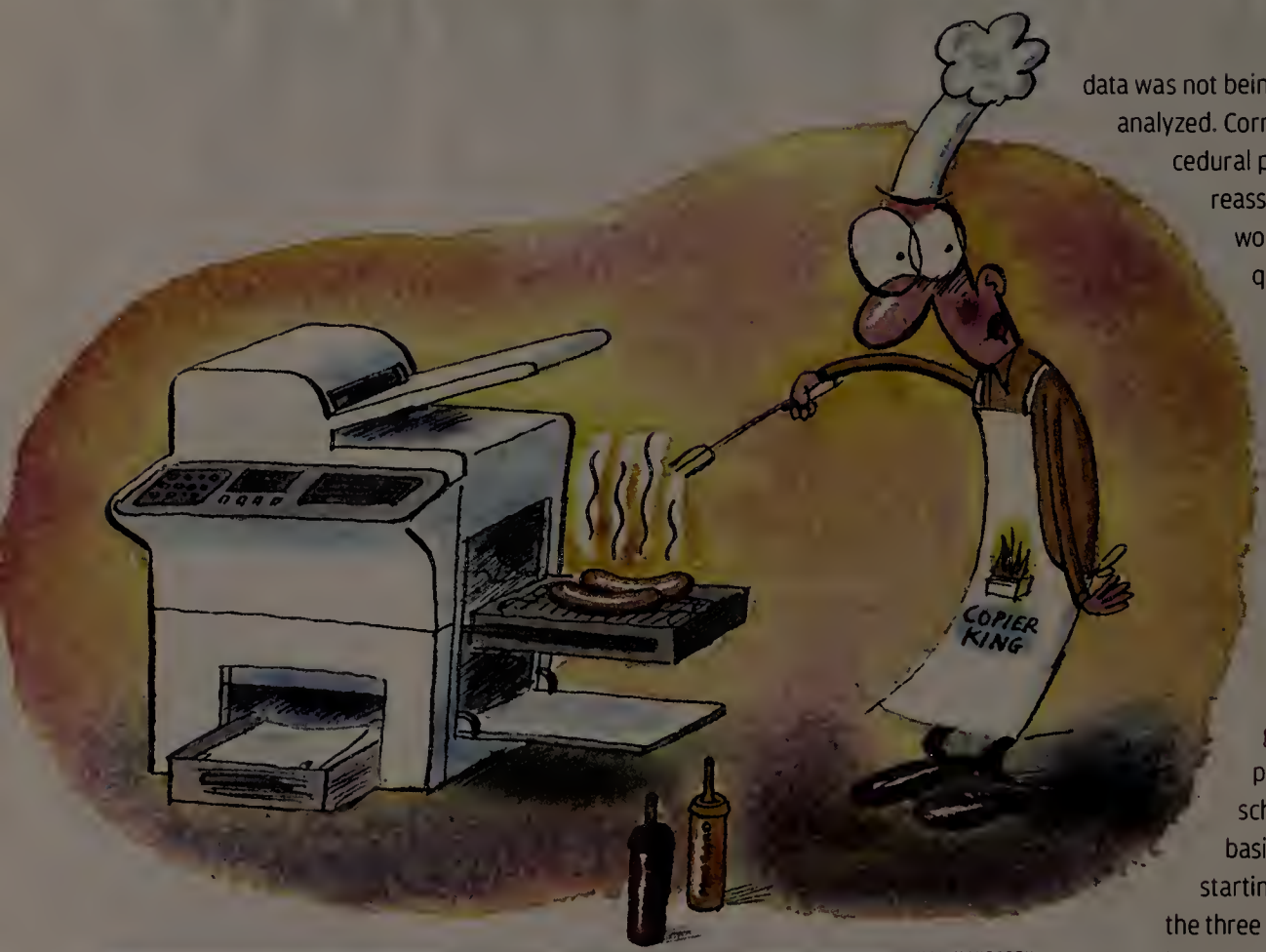

HAL MAYFORTH

Just Like 7-Eleven

It's a few decades back, and this consultant tech pilot fish gets a call to fix a big photocopier that's under a maintenance contract. "I was told the copier kept jamming, spreading toner spots across the pages and staining the pages with oil," fish says. "I checked out the copier and found nothing wrong." But problem reports keep coming in for weeks, and each time there's nothing wrong when fish checks the machine. He finally asks for permission to spend an entire day watching the copier, and with his boss's OK he settles into a nearby chair one morning to wait for problems. The copier works flawlessly all morning. "Then, at a quarter to noon, it happened," says fish. "One of the office workers came in with his lunch box. He opened the access door on the copier, slid out the fuser assembly – and laid two hot dogs across the top of it."

Thanks, Now *Go Away!*

Very large corporation engages this pilot fish to conduct Sarbanes-Oxley audits of some of the company's financial and quality-control applications. "The applications were running on OpenVMS systems, and the audit involved many batch procedures," says fish. "OpenVMS has a handy feature that tells batch queues to retain jobs that issue an error and fail, so I enabled it. When I did, I found that many procedures were not running to completion. The end result was that QA and financial reports were badly skewed because data was not being completely analyzed. Correcting the procedural problems and reassessing 10 years' worth of data showed quality and profits were not nearly as good as had been reported. I was swiftly paid off and shown the door."

Cause and Effect

This school's Internet connection can get flaky, so an IT pilot fish teaches the school admin some basic troubleshooting, starting with "power-cycle the three boxes in the wiring closet that have the blue stickers on them." But one day fish gets an urgent voice mail from the admin, telling him the Internet is down, listing the troubleshooting steps she tried and ending with, "Of course I checked the printer but it had plenty of paper." That's followed shortly by a message saying Internet has been restored. But it's days before fish gets a chance to talk to the admin. Printer paper? "Well," she says, "one of the times the Internet was down, I happened to notice the printer was out of paper. So I added paper and the Internet came back up. And the printer is connected to the Internet, so I figured maybe the printer was somehow causing problems with the connection, and I added checking the printer paper to my troubleshooting steps."

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Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement PM40063731. **CANADIAN POSTMASTER:** Please return undeliverable copy to PO Box 1632, Windsor, Ontario N9A 7C9. Computerworld (ISSN 0010-4841) is published twice monthly except for the month of July by Computerworld Inc., 492 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171.

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PAUL GLEN

To Wield Influence, You'd Better Know What It Is

> Influence is not merely a softer form of power.

WE IN IT WANT TO BE MORE INFLUENTIAL in our organizations. We think our influence is insufficient in an era when technology is ubiquitous and essential to every organization. But despite our desire to wield more influence, we are not clear on what influence is. Given that confusion, we pursue influence in all the wrong ways.

I made this realization recently, when a group of 70 CIOs and IT directors gathered for a half-day seminar I gave on the topic of "Overcoming the IT Influence Deficit." I decided to test our common understanding of the subject matter. Even in this group of very smart, senior technical leaders, all of whom had chosen to attend a seminar on influence, definitions were all over the map.

The biggest confusion for these leaders was that they couldn't separate the concepts of power and influence. For them, the two were fuzzily overlapping. Loosely, they thought about power as making people do what you want and influence as persuading people to do what you want when you don't have (or choose not to exercise) power. In other words, they thought of power and influence as just alternate ways to get people to do your bidding.

But these ideas are really completely distinct. Influence is not merely a softer form of power. They operate completely differently. So it's no wonder our approaches often fail.

Power is very simple at its core. It is one person's ability to affect the behavior of another.

For example, if you are called to jury duty, the judge has the power to compel your attendance. If you don't show up, she can issue a bench warrant for your arrest. She can coerce you, unconcerned about why you chose to comply.

Influence is also very simple. But it involves one person's ability to affect the inner experience of another person, to change how the other person thinks and what he believes and, most importantly, what he feels.

Influence does not operate directly on behavior. If someone changes his behavior because his inner experience was changed by an influential person, that change is a secondary effect. So if you show up for jury duty, you might have to listen to two lawyers attempt to influence the way you think about the case being tried. They have no power to coerce you and the other jurors to vote one way or another once your deliberations begin. They attempt to change your inner experience with facts, logic and emotion in hopes that you will see the case in a way that is to their client's advantage.

A lawyer who isn't influential isn't going to be very successful in his calling. More and more, I'd say the same is true for IT professionals. But I think we see the things that we can do to influence others as being manipulative, and we generally don't like the idea of manipulating others' feelings, positively or negatively. We think that other people's inner experiences are their own business and that we should only need facts and logic to influence them. But as numerous studies have shown, decision-making is primarily emotional, not logical, so our approach often fails.

If we want IT to become more influential, our first step will be to accept that it requires that we become willing and able to change how our business partners feel. And that will require overcoming our own emotional resistance to influencing their emotions. ◆

Paul Glen, CEO of Leading Geeks, is devoted to clarifying the murky world of human emotion for people who gravitate toward concrete thinking. His newest book is *8 Steps to Restoring Client Trust: A Professional's Guide to Managing Client Conflict*. You can contact him at info@leadinggeeks.com.

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